

REMARKS

Each of claims 1-24 remains pending in this application, with claims 1-6 and 8-14 remaining at issue, of which 1 and 10 are independent claims, and claims 7 and 15-24 being withdrawn. With this response, Applicants amend each of independent claims 1 and 10. Each of the amendments finds support in the specification and drawings as originally filed and, accordingly, the amendments add no new matter. In view of the amendments above and the remarks below, Applicants respectfully request reconsideration and favorable action in this case.

35 U.S.C. §§ 102/103 Rejections

Each of claims 1-5 and 8-14 are rejected under 35 U.S.C. § 102(a, e) as allegedly anticipated by U.S. Patent Application Publication No. 2002/0080563 of Pence et al. (hereinafter "Pence") or, in the alternative, under 35 U.S.C. § 103(a) as allegedly obvious over Pence. Each of claims 1-5, 8, and 9 is further rejected as obvious over Pence in view of one or more of U.S. Patent No. 5,836,383 to Zwittig et al. (hereinafter "Zwittig"); U.S. Patent Application No. 5,098,196 to O'Neill; and U.S. Patent No. 5,248,079 to Li. While Applicants respectfully submit that the instant amendment of claims 1 and 10 render the respective rejections moot, Applicants nevertheless provide the following comments.

Independent Claim 10

As amended, independent claim 10 recites a plurality of tubes in fluid communication with one another through a plurality of respective intersections, each intersection formed by an incoming tube and a plurality of outgoing tubes, each of the tubes having a radius that is essentially governed by the following relationship: $r_0^3 = r_1^3 + r_2^3 + r_3^3 + \dots + r_n^3$ where r_0 is the radius of the incoming tube, and r_1, r_2, \dots, r_n are the radii of the outgoing tubes, wherein, for each intersection, at least one of the outgoing tubes is parallel to the incoming tube and at least one of the outgoing tubes is perpendicular to the incoming tube.

Pence is generally directed to heat transport apparatus and methods having consecutively branching flow channels that form branching networks. (See, e.g., Pence at paragraph [0006].) Many of the embodiments of the apparatus and

methods described in Pence include a centrally located inlet port, a branching network extending radially outward from the inlet port, and an exit plenum disposed circumferentially around the branching network. (See, e.g., paragraph [0036]; Figs. 1-4 and 9B.) Others of the embodiments described in Pence include branching networks in which progressive branching levels generally direct flow in one direction between first and second parallel surfaces (see, e.g., Figs. 6, 7A, 7C, 7E, 8, and 9A). One embodiment includes a “square fractal-like” branching configuration in which flow is introduced through a termination layer into a centrally located fluid inlet in communication with the largest tubes, passes through the branching configuration to the smallest tubes, and exits through an exit plenum also in the termination layer and in flow communication with the smallest tubes. (See, e.g., Fig. 5A; paragraph [0053].)

Pence cannot anticipate amended claim 10 because Pence does not disclose all of the elements recited by the claim and, in particular, fails to disclose ***a plurality of intersections each formed by at least one outgoing tube parallel to an incoming tube and at least one outgoing tube perpendicular to the incoming tube***. Each of the radial branching networks disclosed in Pence includes intersections in which an axis of a corresponding incoming tube forms an acute angle (i.e., an angle of less than 90 degrees) with the axis of every corresponding outgoing tube. Meanwhile, each disclosed embodiment having generally transverse flow transitions between incoming and outgoing tubes (e.g., Figs. 5A, 6) includes only intersections in which all outgoing tubes at the intersection are perpendicular to the corresponding incoming tube. Thus, Pence does not disclose a plurality of tubes in fluid communication with one another through a plurality of respective intersections... wherein, for each intersection, at least one of the outgoing tubes is ***parallel*** to the incoming tube and at least one of the outgoing tubes is ***perpendicular*** to the incoming tube, as amended claim 10 recites. Accordingly, Pence cannot anticipate claim 10.

While the Office has not alleged that the elements of amended claim 10 are disclosed or suggested by any combination of Zwittig, O'Neill, and Li, individually or in any combination with each other and/or Pence, Applicants respectfully submit that such an assertion would be untrue because, even considered together, Pence,

Zwittig, O'Neill, and Li fail to disclose or suggest all of the elements of the claim. Specifically, like Pence alone, no combination of these documents discloses or suggests ***a plurality of intersections each formed by at least one outgoing tube parallel to an incoming tube and at least one outgoing tube perpendicular to the incoming tube***. Thus, an assertion that Pence, even in any proper combination with one or more of Zwittig, O'Neill, and Li, would fail to render amended claim 10 obvious.

For at least these reasons Applicants submit that amended claim 10 is patentable over Pence, individually or combined with one or more of Zwittig, O'Neill, and Li. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Independent Claim 1

Similarly to amended independent claim 10, amended independent claim 1 generally requires a plurality of intersections each formed by at least one outgoing tube parallel to an incoming tube and at least one outgoing tube perpendicular to the incoming tube. Specifically, amended claim 1 recites a plurality of flow branch points, each having an incoming flow and a plurality of outgoing flows and each formed by the intersection of two or more of the inlet and outlet tubes...wherein each of the intersections is formed by at least one outgoing tube parallel to an incoming tube and at least one outgoing tube perpendicular to the incoming tube. As described above, neither Pence alone, nor Pence in any proper combination with Zwittig, O'Neill, and/or Li, discloses or suggests all of the elements recited in amended claim 1. Accordingly, for at least the reasons described above with respect to independent claim 10, Applicants submit that claim 1 is allowable, and request reconsideration and withdrawal of this rejection.

Dependent Claims


Each of claims 2-6, 8, 9, and 11-14 depends, directly or indirectly, from one of independent claims 1 and 10. Accordingly, for at least the reasons described above with respect to the claim from which it depends, Applicants submit that each of claims 2-6, 8, 9, and 11-14 is patentable over Pence, Zwittig, O'Neill, and/or Li, individually or in any proper combination. Applicants respectfully request reconsideration and withdrawal of these rejections.

CONCLUSION

Accordingly, all remaining claims are in condition for allowance for the reasons provided above. Applicants file this response with a petition, and the requisite fee, for a two-month extension of time, thereby extending the deadline for response to August 10, 2010. Although Applicants believe that no additional fees or petitions are due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 13-2855 of Marshall, Gerstein & Borun, LLP under Order No. 29171/39318A. Should the Examiner wish to discuss any of the foregoing comments or any claim amendments deemed needed to result in allowance, Applicants kindly request the Examiner to contact the undersigned by telephone at the number given below.

Respectfully submitted,

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